

REMARKS

Claims 1-14 and 16-20 stand rejected. Reconsideration of the application is respectfully requested.

As a preliminary matter, Applicant would like to direct the Examiner's attention to the prosecution history of the present application. As originally filed on March 1, 2000, the present application included claims 1-46. Thereafter, Applicant elected claims 1-20 (of which only claim 1 is independent) in Response to a Restriction mailed on September 10, 2001.

In an Official Action mailed on December 5, 2001, the Examiner rejected independent claim 1 under 35 U.S.C. § 102(b) as being anticipated by Neu (U.S. Pat. No. 5,405,255). Each of the dependent claims was rejected as being anticipated or obvious in view of Neu. In a Response filed on March 1, 2002, Applicant amended claim 1 to set forth the subject matter of the invention more clearly.

Subsequently, in a Final Official Action mailed on June 5, 2002, the Examiner rejected independent claim 1 under 35 U.S.C. § 102(b) as being anticipated by Baerg et al. (U.S. Pat. No. 4,980,019). Each of the dependent claims was rejected as being anticipated by Baerg or unpatentable over Baerg et al. in view of Neu. With regard to the Applicant's arguments distinguishing the recited claims over Neu, the Examiner stated, "[r]eference Neu (U.S. 5,405,255) is no longer the primary reference and the argument is moot."

After the Final Official Action, Applicant amended independent claim 1 to further set forth the subject matter of the invention more clearly, and cancelled claim 15 without prejudice in a Response mailed on August 5, 2002. After the Examiner issued an Advisory Action, Applicant filed a Request for Continued Examination (RCE) such that the amendment made in response to the Final Official Action would be entered and fully considered.

Upon consideration of the RCE and Response to the Final Official Action, the Examiner rejected claim 1-14 and 16-20 in the present Official Action. The Examiner once again rejected independent claim 1 as being anticipated by Neu and rejected each of the dependent claims as being anticipated or obvious in view of Neu. With regard to the Applicant's arguments distinguishing the recited claims over Baerg et al., the Examiner stated, "[r]eference Baerg et al. (U.S. 4,980,019) is no longer used as primary reference. The argument is moot."

In summary, it appears that while the Examiner stated that he did not find Applicant's arguments (regarding Neu) persuasive in the Response to the first Official Action, the Examiner was persuaded enough to withdraw the Neu reference as the primary reference in the immediately subsequent (Final) Official Action. Similarly, while the Examiner stated that he did not find Applicant's arguments (regarding Baerg et al.) persuasive in Response to the Final Office Action, the Examiner was persuaded enough to withdraw the Baerg et al. reference as the primary reference in the immediately subsequent (Present) Official Action. However, the Examiner has again cited Neu as the only reference to support his assertions of anticipation and obviousness in the present Official Action. Applicant respectfully requests that the Examiner

once again carefully consider the arguments below to eliminate further protracted prosecution of the present application.

Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 1, 2, 5, 6, 8-14 and 16-19 under 35 U.S.C. § 102(b) as being anticipated by Neu (US 5,405,255). The Examiner's rejections are too lengthy to be efficiently reproduced in their entirety herein. However, with specific regard to independent claim 1, the Examiner stated:

Neu discloses an integrated circuit encapsulation apparatus (col. 4, line 15 to col. 8, line 36 and fig. 6) comprising:

- A first support plate 27;
- A second support plate 53 proximately positioned with respect to the first support plate;
- A cavity plate 29 positioned between the first support plate and the second support plate, where the cavity plate 29 having an aperture 36 configured to accept only a protruding portion of the circuit package (fig 9 and 10) such that the protruding portion of the circuit package contacts the first support plate 27, and where the aperture 36 is sized to create a peripheral void about only protruding portion of the circuit package 33 to permit a molding compound 60 to be disposed there.

Applicant respectfully traverses this rejection. Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569

(Fed. Cir. 1984). Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

The present application is directed to a system for molding a circuit package. More specifically, the present system facilitates the molding of a circuit package and produces a molded circuit package having an exposed die face. One of the disadvantages of prior systems is that they increase package height by encapsulating the entire package (page 2, lines 19-21). The presently claimed system adds no additional height to the top of the circuit package during the encapsulation process since the top surface of the die portion of the circuit package is only encapsulated about its periphery, leaving the surface of the die exposed (page 4, lines 11-12). Not only does the present system alleviate the disadvantages associated with adding additional height to the circuit package during the encapsulation process, but by leaving the face of the die exposed, the present system provides a circuit package that advantageously dissipates heat rapidly (page 4, lines 11-13). To facilitate the encapsulation of the periphery of the die while maintaining exposure of the top surface, the cavity plate is configured such that the die surface is brought into contact with the first support plate, either directly or indirectly through a film. Either way, the configuration of the recited system provides a mechanism whereby the die surface is not encapsulated and therefore overall package height is not increased.

Accordingly, claim 1 recites a system for molding a circuit package comprising a first support plate, a second support plate, and a cavity plate. The cavity plate is positioned “between the first support plate and the second support plate.” Further, the cavity plate has “an aperture configured to accept only a protruding portion of the circuit package such that *the protruding*

portion of the circuit package contacts the first support plate.” Still further, “the aperture is sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed thereabout.”

Conversely, the Neu reference discloses a molding system wherein a die is completely encapsulated during the molding process to encompass and cover the top surface of the die. While Neu contemplates facilitating different sizes and vertical dimensions (col. 5, lines 18-62), it is clear that Neu does not disclose a system for encapsulating an integrated circuit wherein the top surface of the die is left exposed after the encapsulation process. The Examiner has characterized the cavity insert 29 as providing the cavity plate element of claim 1. However, it is clear that the cavity insert 29 does not have an aperture configured to accept a protruding portion of the circuit package *such that the protruding portion of the circuit package contacts the first support plate*. Further, it is clear that the cavity 36 is *not* “sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed thereabout.”

To be clear, the cavity 36, as disclosed in Neu, provides a void around the periphery *as well as over the surface* of the chip 33 during the encapsulation process as evidenced by Fig. 6 and the accompanying description. While the drawing of the cavity 36 and cavity insert 29 in Figs. 3, 4, and 7 (cavity insert 29a) are not detailed enough to depict the void above the surface of the chip 33 during the encapsulation process, it is clear that the system disclosed by Neu produces such a void during encapsulation. The type of package disclosed by Neu may be disadvantageously thick because the molding compound is disposed onto the top surface of the

chip 33, thereby increasing the overall thickness of the package. As described above, the present system discloses a system than encapsulates only the periphery of the protruding portion of the package (i.e. the semiconductor chip 20).

Thus, it should be clear that the Neu reference does not disclose all of the elements recited in claim 1, since the Neu reference does not disclose a cavity plate “having an aperture configured to accept only a protruding portion of the circuit package *such that the protruding portion of the circuit package contacts the first support plate*, wherein the aperture is sized to create a peripheral void about *only the protruding portion of the circuit package* to permit a molding compound to be disposed thereabout.” Accordingly, the Neu reference cannot possibly anticipate the subject matter set forth in claim 1.

Applicant respectfully submits that independent claim 1 is allowable for the reasons set forth above. Dependent claims 2-14 and 16-20 are believed to be allowable because of their dependencies on allowable base claim 1. However, Applicant further addresses the subject matter of certain of the dependent claims below.

With regard to claim 5, the Examiner stated that “Neu discloses the first support plate 27 comprises a film 32 disposed on contact with the protruding portion of the circuit package 33 (fig.10).” Claim 5, as amended, recites a system for molding a circuit package “wherein the first support plate comprises a film disposed in contact with the protruding portion of the circuit package.” The film 95 may be used to account for height differences in the die such that the surface of the die and the first support plate are in contact during the encapsulation process. This

facilitates encapsulation whereby the top surface of the die is left exposed after the encapsulation process. It is clear that the carrier strip 32 is not disposed between the first support plate and in contact with the protruding portion (i.e., the die) of the circuit package. Thus, the Neu reference does not disclose the subject matter of claim 5, for these reasons, as well as for the reasons set forth above with regard to the base claim 1. Accordingly, the Neu reference cannot possibly anticipate the subject matter set forth in claim 5.

With regard to claim 8, the Examiner stated, “Neu discloses the first support plate 27 comprises a plateau (fig. 8 area 49).” Claim 8 recites a system wherein the first support plate comprises a plateau which resides adjacent a recess in the cavity support plate. However, as illustrated in Figs. 1, 2, 6, and 8 of the Neu reference the flood gate 49 (characterized by the Examiner as the presently recited “plateau”) is not part of the loading bar 27 (“first support plate”). Rather, the flood gate 49 is part of the support platform 12, as clearly illustrated in Fig. 2. Because the flood gate 49 is not part of the loading bar 27, it is clear that claim 8 recites elements not disclosed in the Neu reference. Thus, the Neu reference does not disclose the subject matter of claim 8, for these reasons, as well as for the reasons set forth above with regard to the base claim 1. Accordingly, the Neu reference cannot possibly anticipate the subject matter set forth in claim 8.

In the “Response to Arguments” section of the Official Action, the Examiner stated: “Applicant argues that the reference Neu (U.S. 5,405,255) covers the top surface of the chip during the encapsulating process (fig. 6). However, claim 17 claims the non-protruding surface completely covered with a molding compound. Neu meets the claimed limitation.” Applicant

respectfully submits that the Examiner is confused. To be clear, the non-protruding surface refers to the top surface of the substrate 20. The protruding portion refers to the semiconductor chip 30. With this in mind, the Examiner's statement is of little consequence. Claim 17 is believed to be allowable for the reasons discussed above with regard to the base claim.

In view of the remarks set forth above, Applicant respectfully submits that the subject matter of independent claim 1 and dependent claims 2, 5, 6, 8-14, and 16-19 is not anticipated by Neu since the present claims clearly recite elements not found in the cited reference. Accordingly, Applicant requests withdrawal of the Examiner's rejection and allowance of claims 1, 2, 5, 6, 8-14 and 16-19.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 3, 4, 7 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Neu. Each of the rejected claims is dependent on claim 1. The Examiner's rejections are too lengthy to be efficiently reproduced in their entirety herein. Applicant respectfully traverses this rejection.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that

the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Further, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Based on their dependency on independent claim 1 and for the reasons set forth above with regard to the rejection under 35 U.S.C. § 102, claims 3, 4, 7 and 20 are not rendered obvious by the cited reference. Since the cited reference does not disclose all of the elements recited in claim 1, the Examiner has failed to meet his burden of establishing a *prima facie* case of obviousness for those claims dependent thereon. In view of these remarks, Applicant respectfully requests withdrawal of the Examiner's rejection and allowance of claims 3, 4, 7 and 20.

In view of the repetitive nature of the prosecution history of the present application, and in an attempt to circumvent any further obviousness rejections based on the Neu reference, Applicant submits that modification of the Neu reference in the manner recited by the present claims, is simply not obvious. As discussed above, with reference to the rejection of base claim 1, Neu does not disclose or suggest providing an aperture sized to produce a molded package wherein the top surface of the die is left exposed. Contrary to statements by the Examiner, providing an aperture to facilitate the molding of the periphery of the die only to alleviate the addition of any height to the package is clearly a problem that is not envisioned by the Neu

reference. The variation in aperture heights described in the Neu reference do not contemplate providing an aperture height to block encapsulation of the die surface. The Neu reference simply does not appreciate the disadvantages associated with increasing the height of the circuit package by encapsulating the die surface.

Further, even if the aperture described in Neu were incidentally constructed such that the surface of the die is brought in contact with the first support plate (i.e., loading bar 27) during encapsulation, it is not at all clear from the Neu reference that the contact point between the loading bar 27 and the surface of the die would create a sufficient seal to block the deposition of molding compound onto the surface of the die. In fact, without the introduction of a resilient film or resilient material on the first support plate, it would appear that sizing the aperture with the same height as the die, as described in the Neu reference, may not only fail to adequately encapsulate the die, but it may cause damage to the die surface. As can be appreciated by the Examiner, a section 103 rejection based upon modification of a reference that destroys the intent, purpose, or function of the invention disclosed in the reference is not proper, and a *prima facie* case of obviousness cannot be properly made. In short, there would be *no technological motivation* for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F.2d 900, 211 USPQ 1125 (Fed. Cir. 1984).

Conclusion

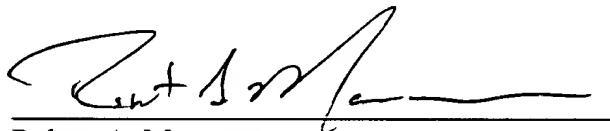
In view of the remarks and amendments set forth above, Applicant respectfully requests allowance of claims 1-14 and 16-20. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

General Authorization for Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Applicants authorize the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 13-3092; Order No.: MICS:0043 (99-0634).

Respectfully submitted,

Date: February 5, 2003



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